

REMARKS/ARGUMENTS

Favorable reconsideration of this application is requested in view of the above amendments and in light of the following remarks and discussion.

Claims 1-12 are pending. Claims 1-6 are withdrawn. Claim 7 is amended. Support for the amendment to Claim 7 can be found in the published application at numbered paragraphs [0044]-[0046], for example. Claim 12 is newly added. Support for newly added Claim 12 can be found in the published application at numbered paragraphs [0044]-[0046] and Fig. 3, for example. No new matter is added.

In the outstanding Office Action, Claims 7 and 9-11 were rejected under 35 U.S.C. § 102(b) as anticipated by Tsuchiya et al. (U.S. Patent No. 5,716,534, herein “Tsuchiya”). Claims 7-9 and 11 were rejected under 35 U.S.C. § 102(b) as anticipated by Koshiishi et al. (U.S. Patent No. 5,919,332, herein “Koshiishi”). Claim 8 was rejected under 35 U.S.C. § 103(a) as obvious over Tsuchiya in view of Koshiishi. Claim 10 was rejected under 35 U.S.C. § 103(a) as obvious over Koshiishi in view of Tsuchiya.

Regarding the rejection of Claims 7 and 9-11 as anticipated by Tsuchiya, that rejection is respectfully traversed by the present response.

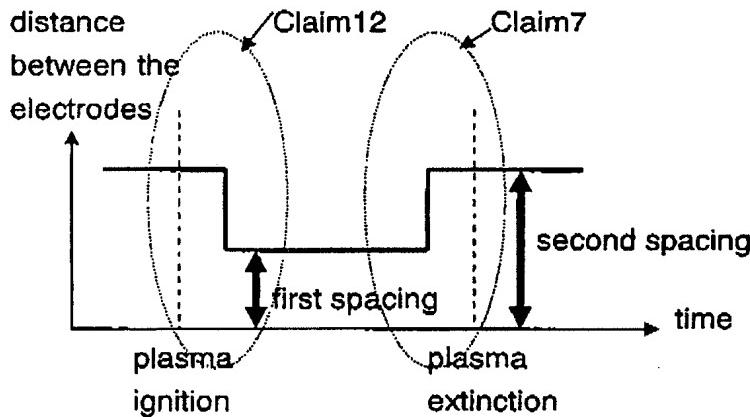
Amended independent Claim 7 recites:

an adjusting mechanism for adjusting a spacing between the upper and lower electrodes by raising or lowering the lower electrode, the adjusting mechanism including a driving mechanism;

...
wherein the drive mechanism sets the spacing from a first spacing to a second spacing before the time of plasma extinction and after the time of plasma ignition, and the second spacing is larger than the first spacing.

Accordingly, the drive mechanism sets the spacing from the first spacing to the second spacing **before the plasma extinguishes and after the time of plasma ignition**. The second spacing is larger than the first spacing.

One example of the above-noted arrangement is shown in the figure below, which represents the position of the electrodes in relation to whether plasma is ignited as further depicted in Fig. 3 of the application.



The outstanding Office Action asserts that movement of a drive mechanism when a wafer is loaded and unloaded correlates to making a space between upper and lower electrodes before plasma larger before the time of plasma extinction than during plasma processing.¹ However, amended independent Claim 7 recites that the spacing is set from the first spacing to the second spacing before the plasma extinguishes and after the time of plasma ignition. Loading and unloading of the wafer does not occur before the plasma extinguishes and after the time of plasma ignition. Accordingly, Tsuchiya fails to teach or suggest the above-noted features, and Applicants respectfully submit that amended independent Claim 1 patentably distinguishes over Tsuchiya for at least the reasons discussed above.

The outstanding Office Action asserts that Koshiishi describes a plasma processing apparatus “wherein the adjusting mechanism 7, 8 has a drive mechanism for making the spacing larger at least at the time of plasma extinction than during plasma processing of the object to be processed placed on the lower electrode.”²

However, in describing the operation of the drive motor (8), Koshiishi states:

¹ Outstanding Office Action, pages 6-7.

² Outstanding Office Action, page 3-4.

At first, after the pressure of a load lock chamber 52 is changed to be equal to the pressure of a processing chamber 2 or after the pressure of the load lock chamber 52 is increased to be higher than the pressure of the processing chamber 2 to a predetermined extent, the gate valve 51 is opened and a wafer W is conveyed into the processing chamber 2 by the conveyer 53. In this state, the susceptor 6 is moved down by operation of a drive motor 8 and is kept in a stand-by state for receiving a wafer W. Then, the wafer W is mounted on an electrostatic chuck 11 by the conveyer means 53. Thereafter, the conveyer means 53 is kept aside, and the gate valve 51 is closed. In addition, the susceptor 6 is moved up to a predetermined position by operation of the drive motor 8.³

Therefore, the susceptor (6) is moved down by operation of a drive motor (8) at the time of a **stand-by** state of plasma processing, i.e., before the beginning of plasma processing.

In describing an alternate embodiment, Koshiishi states:

At first, after the gate valve 51 is opened, a wafer W is conveyed into the processing chamber 2 by the conveyer means 53. In this state, the susceptor 6 is moved down by operation of a drive motor 8 and is kept in a stand-by state for receiving a wafer W. Then, the wafer W is mounted on an electrostatic chuck 11 by the conveyer means 53, and thereafter, the conveyer means 53 is kept aside, and the gate valve 51 is closed. In addition, the susceptor 6 is moved up to a predetermined position by operation of the drive motor 8. Subsequently, the internal pressure of the processing chamber 2 is reduced by a vacuum suction means 41, to a predetermined pressure value. Thereafter, a CF₄ gas is supplied from a processing gas supply source 27, and the pressure of the processing chamber 2 is set to and maintained at 10 mTorr, for example.

Thereafter, the upper electrode 21 is supplied with a high frequency power of frequency 27.12 MHz from the high frequency power source 47, and then, a plasma is generated between the upper electrode 21 and the susceptor 6.⁴

Again, the susceptor (6) is moved down by operation of a drive motor (8) at the time of a **stand-by** state of plasma processing, i.e., before the beginning of plasma processing.

Accordingly, Koshiishi fails to teach or suggest a drive mechanism that sets the spacing from a first spacing to a second spacing **before the time of plasma extinction and**

³ Koshiishi, col. 11, lines 44-57.

⁴ Koshiishi, col. 22, lines 1-19.

after the time of plasma ignition, and the second spacing is larger than the first spacing as recited in amended independent Claim 7. Therefore, Applicants respectfully submit that the rejection of independent Claim 7 as anticipated by Koshiishi is overcome.

Claims 8-12 depend, directly or indirectly, from amended independent Claim 7. Accordingly, Applicants respectfully submit that dependent Claims 8-11 patentably distinguish over any reasonable combination of Tsuchiya and Koshiishi for at least the same reasons as amended independent Claim 7 does.

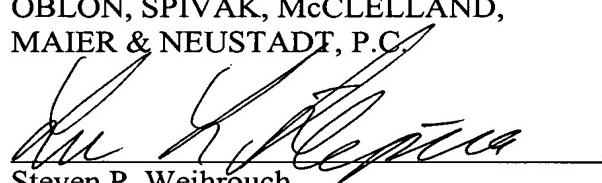
Newly added dependent Claim 12 recites that the driving mechanism sets the spacing to the first spacing after the time of plasma ignition. Applicants respectfully submit that neither of Tsuchiya and Koshiishi teaches or suggests this feature, and newly added dependent Claim 12 further patentably distinguishes over any proper combination of the cited references for at least the additional reasons discussed above.

For the foregoing reasons, it is respectfully submitted that this application is now in condition for allowance. A Notice of Allowance for Claims 7-12 is earnestly solicited.

Should Examiner Crowell deem that any further action is necessary to place this application in even better form for allowance, she is encouraged to contact Applicants' undersigned representative at the below-listed telephone number.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Steven P. Weihrouch
Attorney of Record
Registration No. 32,829

Lee L. Stepina
Registration No. 56,837

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 03/06)